

Recent JMA's activities for climate related decision making
- Climate Risk Management in the Apparel Industry -

Shoichiro Miyawaki

Climate Prediction Division, Japan Meteorological Agency



Outline

- Introduction
 - Climate Risk Management for Apparel Industry
- Relationship between fashion items and weather factors
 - Some examples
- Use of a two-week forecast for apparel sectors
 - Some examples
 - Implementation of action plans
- Further activities
 - Awareness campaign for users
 - Climate Risk Management for other sectors

Introduction

Background

The Japan Meteorological Agency (JMA) has been conducting a project to promote climate risk management (**CRM**), which involves reducing weather risks caused by extreme events such as heat waves or cold spells, in various sectors using extended-range weather forecasting, especially using the “Early Warning Information on Extreme Weather”(a two-week forecast).

EWIEW

**Early Warning
Information
on Extreme
Weather**

From 2008



Pilot Project

**Development of
an early warning
system
for agriculture**

From 2010



Joint Research

**Collaborative
research with
private sectors in
apparel industry**

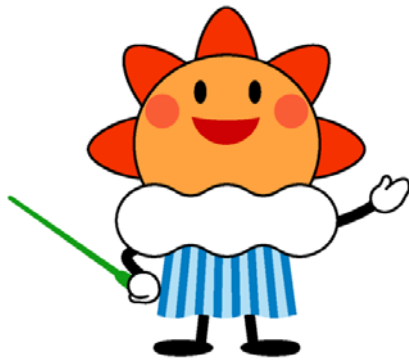
From 2012

Collaborative research with apparel sector

Research in the Apparel Industry

We JMA investigated the relationship between fashion items and weather factors, especially temperature. Additionally, we investigated how to use the two-week forecast for sales promotion to get more benefit.

(Special thanks for “Japan Apparel Fashion Industry Council” and “Life & Business Weather, Inc”)



Provider

JMA

Japan Meteorological Agency



Collaboration!

JAFIC
JAPAN APPAREL-FASHION
INDUSTRY COUNCIL

Users

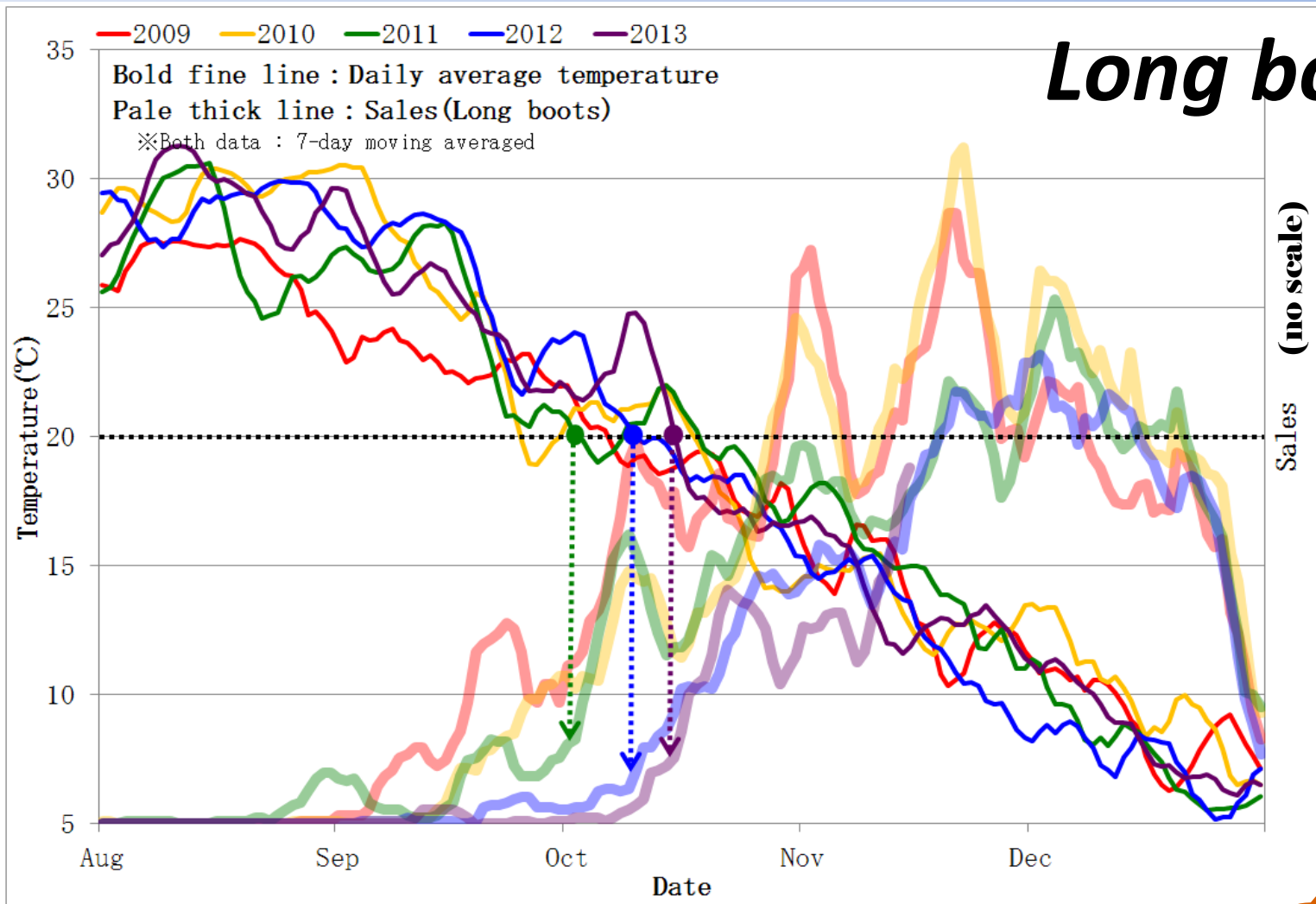
JAFIC

Japan Apparel-Fashion Industry Council

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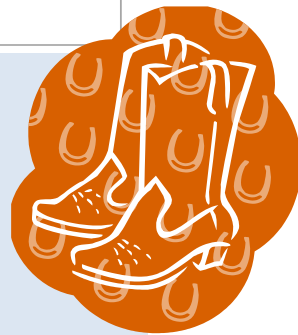
Relationship between fashion items and temperature



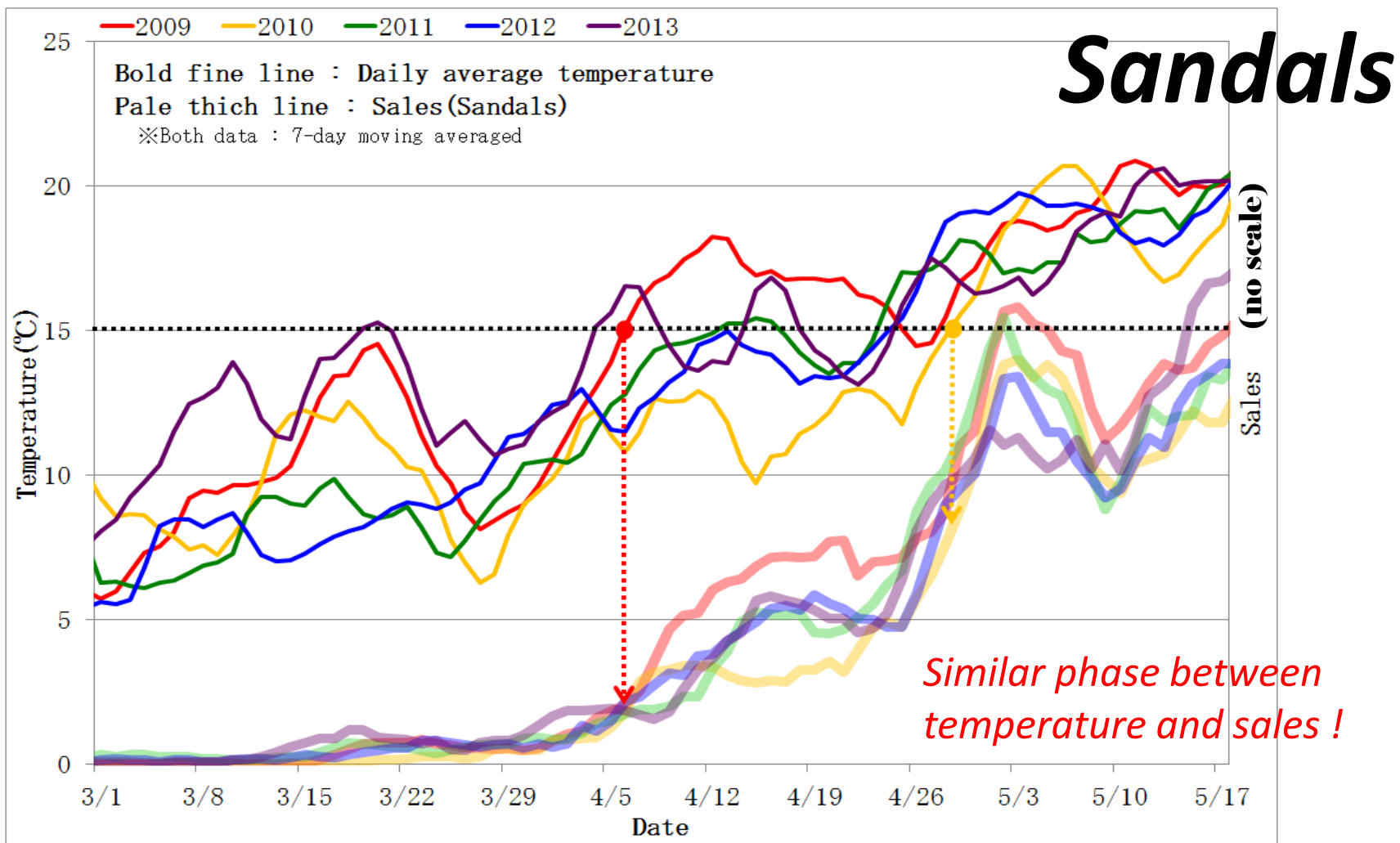
Time series of the sales volume* of long boots and average temperature

- Sales volume of long boots: Tokyo metropolitan area
- Temperature: Tokyo

* Sales volume tends to increase around 20 degC.



Relationship between fashion items and temperature



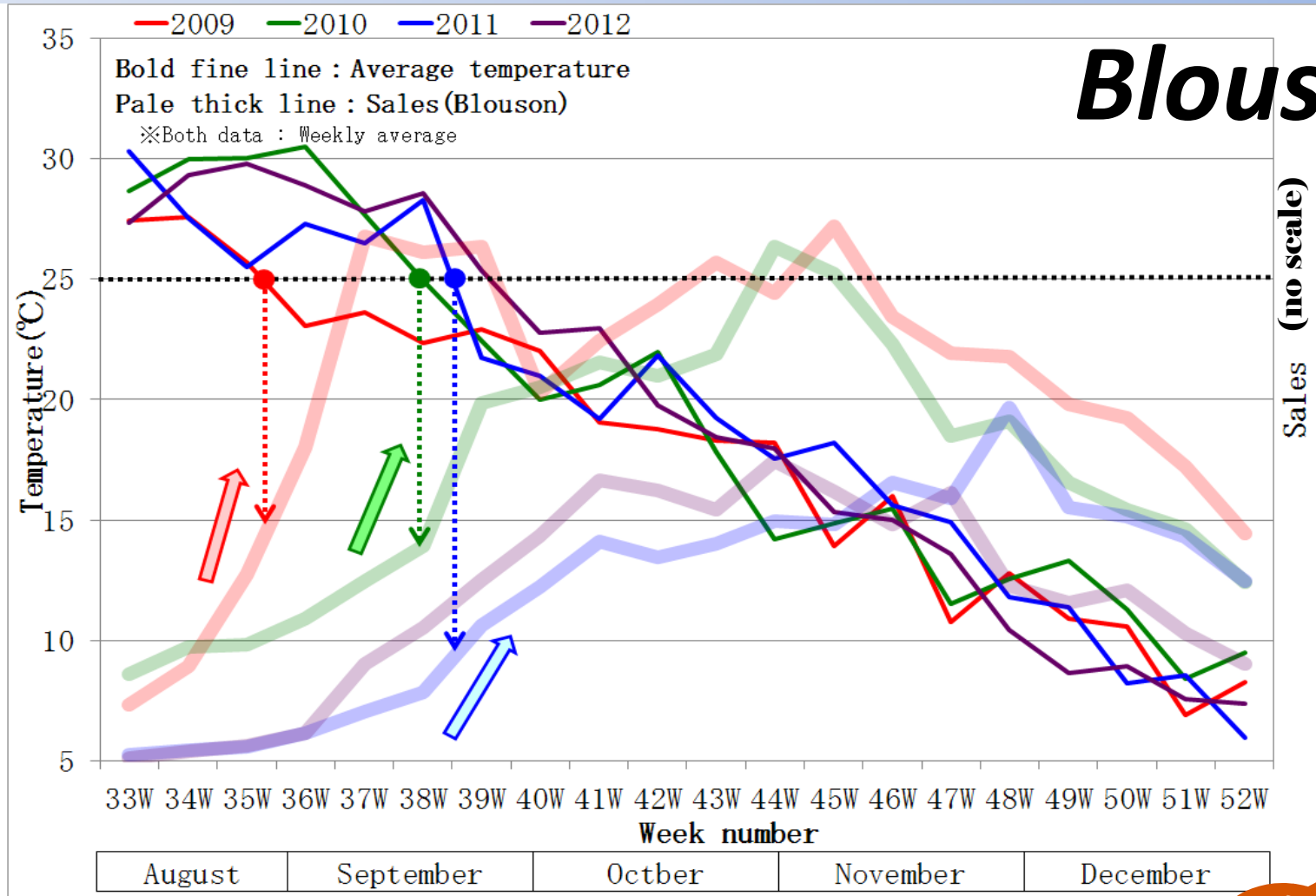
We investigated the relationship between sales of sandals and temperature. The target period was from March to May, when temperature rises.

- Sales volume of sandals: Tokyo metropolitan area
- Temperature: Tokyo

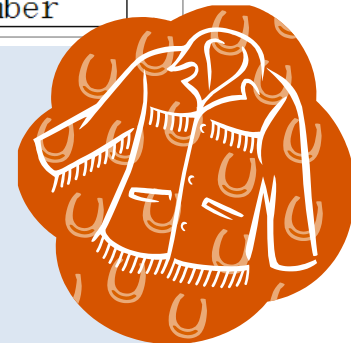
* Sales volume tends to increase around 15 degC.



Relationship between fashion items and temperature

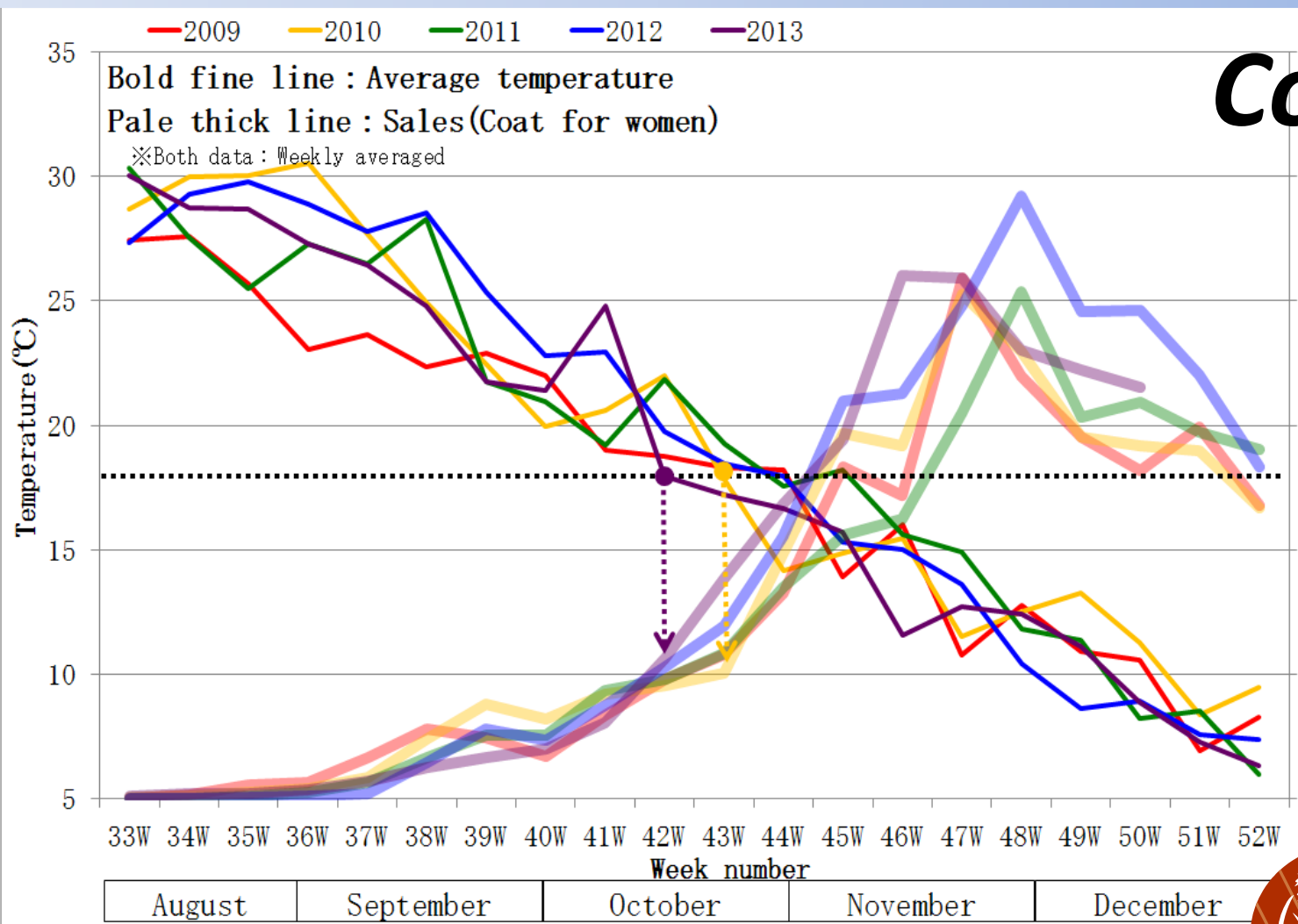


- Weekly sales volume of blouson in stores around the Tokyo metropolitan area
 - Temperature: Weekly average temperature (Tokyo)
 - The weekly data is summarized from Monday to Sunday.
- * Sales volume tends to increase around 25 degC.

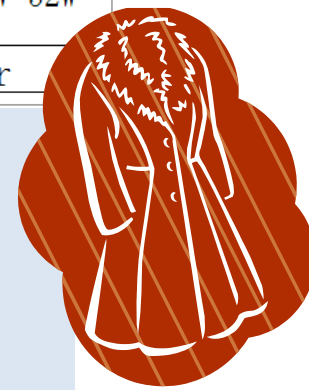


Relationship between fashion items and temperature

Coats



- Weekly sales volume of coats for women in stores around the Tokyo metropolitan area
- Temperature: Tokyo
- Weekly average temperature (Tokyo)
- * Sales volume tends to increase around 18 degC.



Relationship between fashion items and temperature

Threshold temperature for items

Item	Threshold temperature
Sandals	15°C↑
Knit items for women	27°C↓
Blouson	25°C↓
Long boots	20°C↓
Innerwear tops for autumn and winter	20°C↓, 15°C↓
Coats for women	18-19°C↓
Knit hats	15°C↓

↓ = Sales increase when the temperature falls below the threshold.

↑ = Sales increase when the temperature rises above the threshold.

This results is especially comes from our research case (at Tokyo). Another analysis will be needed for each own cases .

Outline

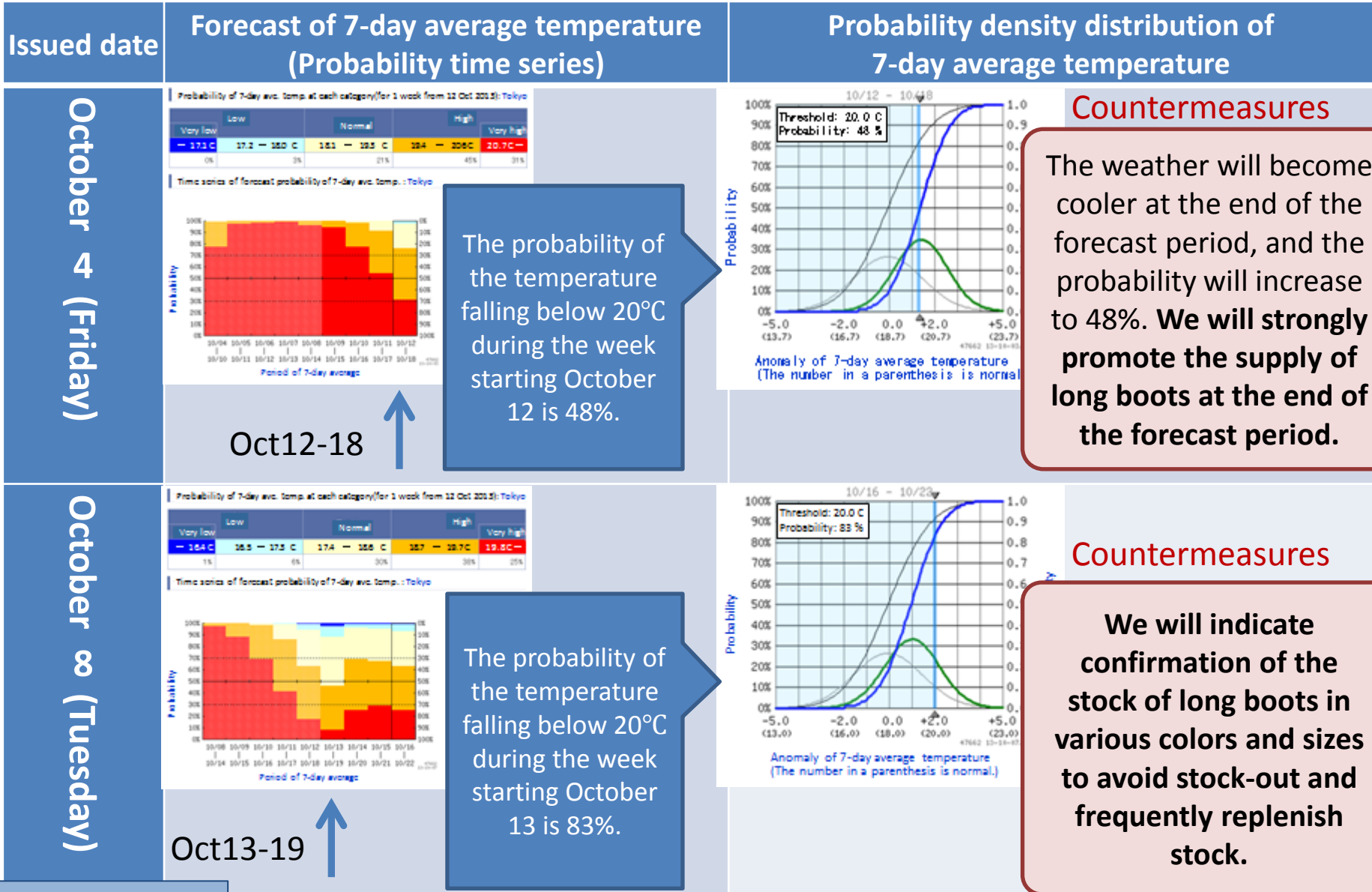
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Use of a two-week forecast for CRM

An apparel company tried to hedge weather risks by using a two-week forecast.

Long boots

20°C ↓



Target place is Tokyo

Implemented action plans for CRM

On the basis of results and discussions with Apparel companies, the following action plans for sales promotion might be implemented:

○Deciding a proper time for increasing/decreasing the number of each item

For example, for late summer heat, we will keep items suitable for high temperature (replace cut-and-sew dresses and pants with blouson).

○Modifying the supply volume from warehouses to stores

For example, when temperature is forecasted to exceed the threshold, we will increase the number of colors and sizes of sandals to prevent stock-out.

○Strengthening visual merchandising (VMD) such as point of purchase(POP)

For example, if we expect knit hats sales to increase, we will move knit hats to the aisle space (eye-catching area for customers).

○Preparing a sales talk for customers

For example, when temperature is forecasted to fall to the threshold, where innerwear is required, store assistants will ask customers to prepare for cold weather with innerwear.

○Arranging a sales floor plan

For example, if the late summer heat continues and knit hat sales do not increase, we will keep cut-and-sew items suitable for high temperature.

Strategies for the future

- We now provide 2-week forecast as average temperature, but it is not easy for general person (like sales clerks) to understand intuitively, so **forecasting for the maximum or minimum temperature** would be preferable.
- Each area possibly has a different threshold temperature, so we should collect more precise data at each area and develop an analysis.
- Considering **errors in forecasts**, we should prepare a **guideline on how to use probability forecasting** (for example, action plans according to rank).

Outline

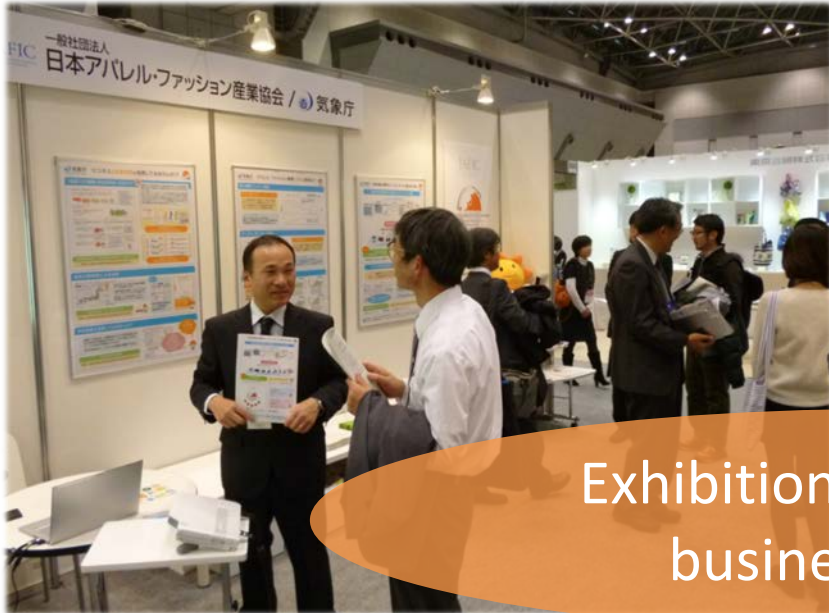
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Further activities for spreading CRM in the apparel Industry



Seminar

Seminars of how to use climate information for CRM



Public relations field

Exhibitions of events for business solution

CRM Activities for other sectors

- We JMA now planning to research CRM in other sectors of Industries which is highly affected by weather and climate.
(for example pharmacy, department store, and so on.)
- In the Agricultural sectors, JMA is conducting new joint researches with agricultural research centers all over Japan.



We are planning to release the cultivation management systems for whole regions in Japan, to stably supply farm products.

Hokkaido

Beating potatoes harmful for field condition using cold temperature



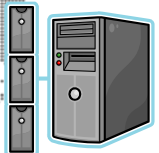
Tohoku

2-weeks ahead Temperature prediction for rice crops .etc



Kanto (Central)

Making data set of weather information for agriculture .etc



Kinki-Chugoku-Shikoku

Prediction of Red mold disease of wheat



Kyushu-Okinawa

Prediction of High-Temperature Damage to Rice Grain



Thank You !!

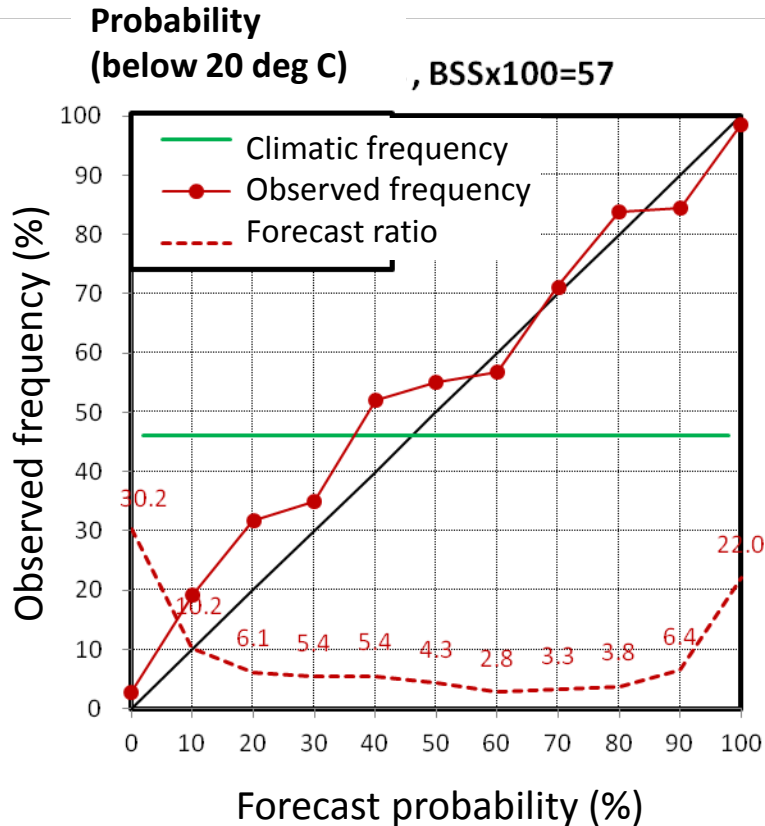


HARERUN : A mascot of JMA

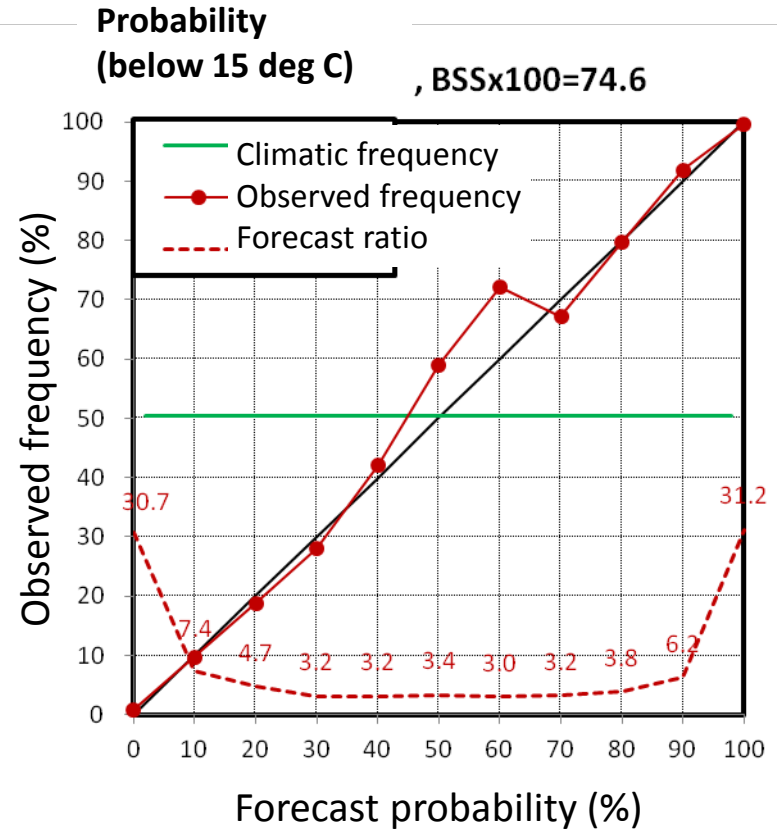
Backup Slides

Forecast's Reliability

- Reliability diagram from Hindcast of past 30 years(1981 to 2010)
- 2-week Ahead forecasts of points in Kanto Region(around Tokyo)
- Probability of below xx deg C (7-day average temperature)



- Target : forecasts of Date in September
- N=1800



- Target : forecasts of Date in October
- N=1800